

Report of Peabody Electric Light Commission Appointed By Mayor Joseph B. O'Keefe To Study Need of New Municipal Plant

Report No. 1

(Signed by three of five members)

Hon. Joseph B. O'Keefe, Mayor of Peabody:

After a careful study of the situation in Peabody we submit the following report and recommendations:

We, the citizens of Peabody now own the soundest, best and most profitable business in the city — namely the Municipal Light Plant.

From an initial investment of \$60,000 made forty seven years ago, this property has developed until it is now worth approximately \$400,000 (\$394,578.02). We own it outright — there being no mortgage or indebtedness of any sort on the property.

During the recent depression years when so many of our factories and businesses in Peabody as elsewhere, have either been losing money or have gone into bankruptcy, our plant has earned enough money every single year, without exception, to pay all its own operating expenses, and in addition has contributed to the city out of its earnings approximately one million dollars in the last ten years (\$957,281.05). The money thus contributed has been used for such things as our Tax Levy and Employment Fund thus lightening the tax burden which has been so heavy on us all.

Are we now about to lose this wonderful property with all its benefits through our own carelessness and neglect?

Yes, we probably are — unless we take immediate steps to save it from ruin. After a careful investigation we feel that the time has come when a definite decision must be made if we are to keep this profitable business in our own hands.

PRESENT CONDITIONS

Conditions at the Plant are Deplorable Indeed.

In our generating plant on Endicott Street there remains only one electric generator, more than twenty years old, in bad condition, and not large enough to produce the electricity we sell.

During the past ten years we have paid a half million dollars (\$493,818.40) to the A. C. Lawrence Leather Company to purchase the additional electricity which we had to have to supply our customers and which we could not generate ourselves.

The cost of electricity made with our present equipment is twice as much as it should be. We use 2½ pounds of coal to make one kilowatt-hour of electricity. A modern plant would use less than 1¼ pounds. The electricity we purchase also costs about twice what it would cost if produced with modern equipment.

More important however than the cost of production is the condition of the plant itself. A serious accident at the plant — a breakdown of our only generator — would be a real calamity. It might result in the enforced closing of several factories as well as the loss of part of our lights for a period of several months. Worse than that, it might result in a final shut-down of our plant with the business being taken over by outside private interests. Unfortunately the A. C. Lawrence plant is about as old and unreliable as our own. Such conditions constitute a real emergency and demand prompt treatment.

RECOMMENDATIONS

We recommend that the Peabody Electric Plant be developed as outlined in a report to the Peabody Electric Light Department, submitted by Engineer Arthur L. Nelson, November 10, 1937.

SITE

We have considered other sites, particularly the Southwick property on Foster Street. This location offers real advantages but it would entail an additional expense of over \$100,000, so we favor continuing at the present site.

We recommend the purchase from the Boston & Maine R. R. of strips of land along their tracks on both sides of Endicott Street. We also recommend the purchase from the A. C. Lawrence Leather Company of land adjoining the present Electric Light Plant.

FUEL

We would have the new equipment so installed that either coal or oil might be used as fuel, but for the present would prepare only for the use of coal as suggested in the Nelson report. The purchase of coal as well as other supplies should be so handled that the lowest possible price commensurate with quality may be obtained.

RATES

We recommend that rates for electricity be reduced as rapidly as is consistent with sound financial policy.

SALE OF STEAM

We recommend that the design of the turbines be such that steam may be extracted and sold as desirable customers appear.

We are confident that these last two items viz— low rates for electricity and the sale of steam will attract business. It will help to keep established business here and will be an inducement for new business.

FINANCES

We recommend that every effort be made to secure Federal funds to help finance the project. We recommend that the repayments be so arranged that the whole cost may be paid from the revenue of the plant so that no part of the outlay shall be taken from taxes.

In view of the stringent financial situation exist-

ing in Peabody we recommend that only one boiler and one generator be installed at the present time. The cost would be approximately \$325,000.

While this proposed equipment is enough to generate more than enough power for the city's needs, even at peak load, it will be necessary to have an alternate source of power as a standby in case of emergency.

REPLACEMENT FUND

We recommend that a replacement fund be set up so that a reasonable amount may be reserved each year for future needs. We believe this can be done and at the same time a substantial sum may be turned over to the city treasury each year.

ELECTRIC LIGHT COMMISSION

We recommend that a permanent Electric Light Commission be created, to consist of three members, one to be chosen each two years and to serve a term of six years.

Signed,

JOHN F. JORDAN
JOHN S. MARTIN
DANIEL J. BOYLE

Report No. 2

(Signed by four of five members)

Hon. Joseph B. O'Keefe, Mayor
City of Peabody
Massachusetts

Dear Mayor O'Keefe:

As a result of the appointment of your commission as a fact finding body created for the purpose of determining the advisability of reconditioning the Electric Light Plant or creating other means by which a source of electricity could be obtained for the purpose of taking care of the needs of the citizens, we hereby submit the following information, data, and recommendations.

FOREWORD No one who has studied the Municipal Electric Plants of Massachusetts can fail to be impressed by the State Law which authorized the establishment of the plants and chartered within broad limits the course of their operation.

But if the wisdom of the provisions of the Authorizing Act of 1891 is now apparent that certain unfortunate times of recent years have resulted from the failure of the legislature to adapt the law to conditions of a rapidly developing and changing industry.

In 1889 a committee was appointed for the purpose of investigating the advisability of the Town of Peabody erecting an electric light plant. The subject of the Town of Peabody erecting such a plant of its own was first talked of in the fall of 1889 when two private corporations were endeavoring to secure the franchise from the Town. Special town meetings were held, the matter discussed, and at each successive meeting, the majority in favor of the Town owning its own plant increased. This committee reported in August 1890 as favoring the project and their recommendations were accepted and adopted.

When the Supreme Judicial Court decided that the Town had no right under existing statutes to appropriate money for the purpose, the Town then directed this committee to apply to the legislature for an Act permitting the Town to establish its own plant. With committees from several towns the Peabody committee appeared before the legislative committee. In those hearings the Town was represented by Forest L. Evans, Esq. as counsel. Mr Evans was a thorough believer in the justice of the proposed law and through his untiring efforts the fictitious actions of the witnesses were shown in their true light. The legislative committee made two reports; the minority composed of Senator McDonald of Middlesex, Representative Childs of Swansea, Moriarty of Worcester and Knowlton of Hamilton favoring the petition which was granted.

The expense incurred on account of the Supreme Judicial Court was about \$1,500.00, that before the legislative committee \$500.00, making the total cost \$2,000.00.

To comply with the new law, several town meetings were held, the last of which was in August, 1891.

The committee again reported recommending a change in location and that a larger plant be built, and that the sum of \$4,700.00 be appropriated. The report and the recommendations were accepted. The land having been secured, the plans were prepared and the work of building commenced in the fall of 1891. The foundation and chimney only were completed and work was suspended until spring. The work on the plant was then pushed rapidly ahead and on the 27th of September, 1892, the lamps were first lighted.

Mr. C. O. Mailloux, an electrical expert and engineer of New York, was engaged to make tests as provided for in the contract.

The first equipment consisted of one 150 H. P. Green Engine and four Sperry Arc Machines, and was installed exclusively for the purpose of street lighting.

In 1893, a generator was installed for furnishing commercial and domestic lighting.

In 1909 and 1910, two (2) cross compound Rice & Sargent engines directly connected to General Electric three phase, alternating generators of 300 KW and 500 KW capacity were installed; and in 1917, a 1500 KW steel turbine was installed together with a spray pond and condensing equipment for all of the engines.

In 1927 and 1928, two new steel tube boilers, 650 H. P. were installed, greatly increasing the efficiency of the station.

At this time, 833 incandescent streets lights were being maintained in Peabody and 40 in Lynnfield, the latter being paid for by the Town of Lynnfield. 6,917,110 KW hours of electricity were generated at the station for the year 1928, of which 415,500 KW or less than 6% was used for street lighting.

The Department had 6,100 customers and 350 miles of wire to be maintained, which was erected on 74 miles of public ways besides lines of private property.

Forty-nine 1000 candle power white way lamps illuminated Main Street, Peabody Square, Central and Lowell Streets. Foster Street had five 600 candle power white way lamps while Lynn Street had thirty-one 600 candle power white way lamps. Increased operating efficiency enabled the Department to effect a rate reduction of one cent in 1926 and another cent reduction in 1927. The rate of eight cents at this time with a 10% discount for cash was one of the lowest in the State.

The Municipal Electric Light Plant of the City of Peabody, like that of Braintree, is specially favored by conditions which make for low rates. It has nearly 7,000 customers reached by only 78 miles of lines. It has a large current load and it has been operated for forty-seven years and is free of debt. Like Braintree's, were the conditions in Peabody, when in the middle twenties, municipal rates were being held at an unnecessary high level through the influence of electrical companies. The plant sold electricity for ten cents. It had an adequate power station dependent on purchased power. Its surplus amounted to over 18% of the cost of the plant in contravention of the Municipal Electric law which specifies that rates shall be fixed to earn not more than 8%.

There is, however, a significant difference between the two plants — Braintree's surplus earnings are being used to maintain and modernize the property; Peabody's have always been diverted to the City Treasury for the general expense of the municipality. Not only has this been practiced in Peabody, but past administrations have also raided the sinking fund for the purpose of defraying current municipal expenses.

This raises the question, or of the purpose of objection, of a Municipal Electric Light Plant. Is it to furnish electricity to the inhabitants at the lowest possible price consistent with the supporting business or is it to collect from those who use the electricity for general purposes. Are consumers to be charged with the cost of operating the electric plant or with the cost of running the entire municipality? In some places the latter view prevails and one often hears municipal ownership advocated as a means of figuring freedom from all municipal taxes. In other places, it is held that service is to be rendered at cost.

The archaic municipal electric law of Massachusetts is ambiguous on the subject. In one section, not quite twenty years old, it leans toward the cost theory to include in the tax levy the cost of electricity used for lighting the streets and for other municipal purposes. In another place it authorizes a "Profit" not to exceed 8% and allows the profit to be taken for tax levies. Also, as briefly noted, it provides no penalty for violating the 8% limit.

It is held by many municipal governments in Massachusetts and also by some state officials, that a hidden tax on the price of electricity is not inconsistent with the price of electricity. They argue that the consumer benefits by high priced electricity because it results in a low tax rate: a low tax rate encourages industry: an encouraged industry benefits the public at large. It may or it may not. It may do nothing more than encourage municipal extravagance by neutralizing the effect that extravagance and mismanagement would otherwise have on the tax rate.

A comparison of the tax rates in Braintree and Peabody are interesting, but it is not within the scope of this report to deal with the same as with the hidden tax on electricity. It will be enough to indicate the effect of such a tax on the management of a plant which has operated over a period of years as a tax collecting agency. Peabody has continued to violate the statutes which limits a surplus to 8%.

During 1925, it earned 18%: later it has earned as high as 32%. In nine years prior to 1934, the plant which only cost \$351,000.00, had contributed \$550,000.00 to the running expenses of the City.

What has been the result of a hidden tax amounting to 25% of the price of electricity — the issue has been to deny the public the use of electrical appliances which contribute so much to the convenience of domestic life and to converting electricity to its old functions of lighting and power. During the last fourteen years, the Peabody rate has been reduced slowly from \$0.099. Since 1935 it has dropped from \$0.10, an average of one cent a year, to its present cost. In 1931, a form of rate popularized by Reading, three years earlier was simulated by a stepped rate, but the resemblance was only superficial because the second step did not operate for the public until charges at the highest step reached \$0.30, which meant that for the general public it would not operate at all.

Then an "all purpose household rate" starting at \$0.1036 was adopted. The effect of the diverted earnings on the Peabody Electric Light rate has caused an arrested development.

Line losses in Peabody are shown as amounting to 12.6% of the output contrasted with other municipal plant losses of 10%. This 12.6% loss is rather a false figure due to the fact that charges are

included therein for all the special extraordinary lighting done by the Department such as the lighting done at Christmas time and for parties, fairs, etc. If these were deducted from the 12.6% and claimed as direct charges against those benefiting from such practise, it is quite probable that the line losses would compare very favorably with those of any other municipality.

Peabody's old generating station produces what electricity it can with a fuel cost of nearly 9/10 of a cent compared with 3/10 of a cent in other places.

Purchased power on which the plant is dependent is being sold for \$0.034 average and is costing \$.0157.

The sorry record of the Peabody plant is a timely warning that the milking process which has devitalized its entire system must stop. Though efforts in recent years have brought about a marked change in the sentiment toward public operation of electric utilities, speculations of the late twenties, dramatized by Insull's flight, shook the public faith in the tradition of the far sighted wisdom of the directors of the electric industry.

Advocates of public ownership refer to Seattle's public ownership domestic rate which steps from 5½ cents to 3/4 cents and opponents refer in turn to the rate of the private electric company in the District of Columbia, which steps from 3.9 to 1½, but special cases, usually not comparable because they reflect some special circumstance, only emphasize disagreement and strengthen the impression that public ownership is something essentially untried. Yet in the United States alone over 2,075 municipal electric plants are in operation at the present time.

If the record of municipal operation is ignored by the propaganda of electric companies, the reason is obvious. Enough would be heard about it if it had been less successful than private operation. The reasons why the record is ignored by advocates of public ownership are less obvious, but they may be inferred.

Those who rely on the stock-jobbing practices of "holding companies" for the force of their criticism of private ownership will ignore the record of municipal plants just as they will ignore the record of operating electric companies. Their argument concerns the protection of investors rather than consumers, and would lose its force if an attempt were made to show that the rates of electric companies followed security prices or that the recent speculative flurry produced any disturbance in the relation between the rates of companies and municipal plants. Those who turn mass-statistics to determine the relative achievements of public and private operation will find the record ambiguous. Discrepancies between the rates of different undertakings of the same class make general averages meaningless, and little improvement results from classifying plants into groups by such simple considerations as size or output. The effect of average consumption, load density, and other factors which influence the cost of supplying electricity carries discrepancies into every group. And when investigators competent to evaluate all the factors entering into the cost of service undertake to make a comparison for the industry as a whole, they find that the necessary records are lacking. Few public service commissions require sufficient data in the reports of electric undertakings to establish the factors required for an intelligent comparison of rates.

The action of the present administration in giving public owners a place in the program of public works, abruptly took the subject out of the realm of controversy and made it an accomplished fact. The St. Lawrence power project is receiving presidential support. Boulder Dam is built, and Muscle Shoals, after lying about, is now incorporated in a publicly owned system designed to supply electricity direct to the small consumer, and federal funds have been made available to municipalities for building electric plants.

Strange as it may seem, after all the theoretical arguments of the last twenty years for and against the expedient, public operation of electric utilities is not only a possibility of the future but something which has a past — a past as old as the electric industry itself and so wide and varied that the disposition to ignore it is one of the anomalies of current thought. Advocates of public ownership refer to Seattle's public ownership domestic rate which steps from 5½ cents to 3/4 cents and opponents refer in turn to the rate of the private electric company in the District of Columbia which steps from 3.9 to 1½, but special cases, usually not comparable because they reflect some special circumstance, only emphasize disagreement and strengthen the impression that public ownership is something essentially untried. Yet in the United States alone over 2075 municipal electric plants are in operation at the present time.

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In this respect the State of Massachusetts is almost an exception. A State commission was established as early as 1886 with authority to prescribe a system of accounts for electric companies and to require annual reports in such forms as it might direct. When in 1891 municipalities were authorized to engage in the electric business, their plants were placed under the supervision of the commission. From the outset the commission required in the annual reports, not only a financial statement, but such descriptive data as would enable the financial statement to be translated into terms of managerial achievement. As a result, there is now a record of over 40 municipal plants and over 60 electric companies which have operated under a standard system of accounts through their existence.

For this reason the municipal plants of Massachusetts have been made the subject of frequent studies, notably the voluminous work of Lincoln in 1915 and the analysis made by Porter in 1930. But none of the attempts to determine the relative merits of private and public operation have been successful, and the tentative of older studies, viewed in the light of subsequent experiences, show the ephemeral nature of conclusions based on any momentary state of rapidly changing industry.

The municipal plants of Massachusetts are supplying their public as well as the electric companies; they are supplying it more completely, and at lower rates. Several plants have established a domestic rate which permits everything in the house but the furnace to be operated electrically at an average rate of 2-1/3 cents, and a movement toward a new low average of 1-½ cents has already begun.

But the goal of cheap electricity has yet to be reached. Companies and municipal plants alike are pressing in that direction.

CAUSES OF THE SUCCESS OF MUNICIPAL PLANTS

Four principal causes for the success of the municipal plants of Massachusetts may be noted: the salutary provisions of the municipal electric law enacted in 1891; the limitation in size which the nature of the municipal plant imposes; freedom from taxation; and freedom from certain obsessions common to electric companies.

In the municipal electric law are three provisions which are especially important. The first is that which requires the plants to be self-sustaining. Rates must be fixed to yield every operating expense, interest on the bonded debt, an amount for depreciation fixed by law, and a sufficient reserve to retire any debt in less than twenty years. The too common rumor that the low rates of municipal plants represent subsidies from the tax levies have no foundation in fact.

The clause which provides for the retirement of debt within twenty years has been unexpectedly productive. Unlike electric companies the municipal plants have no refuge in the so-called "capital expense" — something which not only is never paid, but once passed through the routine of the regulatory commission becomes a "prudent investment" on which the public is compelled to pay a "fair return", or in practise a gradually increasing dividend, for all years to come. No one who has wallowed through the accounts of electric companies and seen the persistent and ingenious methods devised to transmute operating expenses, which must be paid out of income, into capital expenses, which are financed by the sale of more securities, can appreciate the haven of refuge which municipal plants are denied.

Staring every municipal manager in the face is the fact that expenses of all kinds must be paid. The result has been frugality (without sacrificing maintenance of lines and equipment) which not only appears in operating expenses, but in the cost of the property and in the balance sheet. The tendency has been to avoid interest-bearing debt, to finance plant additions from income, and even to build up a cash surplus for such extraordinary expenses as the construction of a power station.

Only about 10% of the cost of the property of municipal plants is now represented by outstanding debt; the rest has been paid out of earnings. Nearly half of the plants have no debt whatever. In the aggregate all municipal plants require only six cents of each dollar of income for both interest and the retirement of the remaining debt, whereas companies have a continuing burden of twenty five cents for dividends and interest.

The second provision of the law to be noted is the one which recognizes that a municipal plant is not merely a self-supporting department of the town, but a business calling for responsible leadership. The law requires for every plant the appointment of a manager who "shall have full charge of the operation and management of the plant, the manufacture and the distribution of electricity, the purchase of supplies, the employment of agents and servants, the method, time, price, quantity, and quality of the supply, the collection of bills and the keeping of accounts."

In this connection the law provides that a muni-

cipality may elect a supervising board of three municipal light commissioners, one to be chosen each year, but if that form of supervision is not adopted the manager is left subject to the general executive of the municipality both in appointment and in direction. But politicians have taken little advantage of their power of appointment and changes in the personnel of the managers have been few. The men have grown up with their plants; they are familiar with every detail of the business; and they have been identified by long residence with the public they serve. Consequently, municipal plants have had, at least as much as electric companies, the advantages of concentrated and effective management.

The third provision of the law which has had a far reaching effect is that which requires all municipal plants to keep their accounts and make annual reports in the form prescribed by the public service commission. Although the form which has been prescribed has been proved inadequate for the complicated affairs of many electric companies, it works very well for the simple ways of municipal plants. The various items into which the accounts are divided are supported by descriptive data which not only permit the reasonableness of expenditures to be determined by inspection, but enable comparisons to be made with the performance of other plants. This serves as a warning to politicians that extravagance in the administration of a municipal plant cannot be concealed; it assures the public that nothing is being done in the dark; and it calls the manager's attention to the efficiency of his work.

Next to the municipal electric law in its influence for successful operation has been the limitation on size which the nature of the municipal plant involves. A municipal plant is denied the possibility of achieving importance by extending the area of its operations or by increasing the size of its financial structure through combination with other plants to form a chain. Any ambition towards greatness leads to intensive development of the existing field as the only means of fulfillment.

Both these limitations are usually held to be an unfortunate concomitant of municipal operation, but it is held otherwise here. The electric plant which is obliged to deal with a large area and undertake simultaneously the problems of an industrial center, residential suburbs, and a rural frontier shows at a disadvantage when compared with plants having a smaller or more homogeneous field.

Of the lack of the benefits of "chain" management it may be noted that no municipal plant acquires other plants at exorbitant prices on which the chain as a whole must pay dividends to keep the association (holding company) solvent; no plant must sustain rates to compensate for weak links in the chain; no plant is required to build up a cash surplus to lend to the holding association. Nor is management "chained" in the attempt to substitute a central-office system for intelligence on the spot. Chain management may show remarkable economy when operating expenses are considered alone, but when operating expenses, management fees, and the cost of capital are all brought home, there is nothing remarkable about the resulting rate.

The third of the principal causes of the success of the municipal plants is freedom from taxation. They are exempt from local, state, and federal taxes — taxes that take an average of 12% of an electric company's income. When it is stated that 12% of income, if accumulated over a period of twenty-five years, would make an amount equivalent to the cost of the plant, it becomes evident that tax exemption has contributed substantially to the extraordinary strong condition shown by the consolidated balance sheet of the municipal plants.

Yet, in view of the oft-repeated charge that municipal plants are able to maintain lower rates than companies because of tax-exemption alone, it should be noted that every municipal plant in the State could pay the local property tax equivalent to 7% of its income without disturbing the present level of rates, and the full average of 12% paid by the companies could be paid by the municipal plants without increasing their rates by more than a small fraction of a cent.

Of the state and federal taxes, or any other tax based on profits or the market value of securities, it is enough to say that they are not applicable to plants having no securities and operating at cost rather than for a profit. The local property tax is applicable to municipal plants, and in justice to the taxpayer it should be applied. Some municipal plants realize this, pay the town a small equivalent to the property tax, sometimes taking as much as 25 cents from each dollar of income. They go to the opposite extreme and maintain an unduly low tax rate at the expense of the consumers of electricity. As might be expected, no plants of this class are distinguished by low rates.

In view of these divergent practices there is no average figure for municipal plants corresponding to the 12% tax paid by electric companies. All that can be said is that some municipal plants pay a property tax equivalent to 7% of their income and still keep in the group which maintains the lowest rates in the State.

Freedom from certain obsessions of electric companies is given as the fourth of the major causes of the success of municipal operation. Among the obsessions which have afflicted the companies have been eversion to industrial power plants, fear of going below a standard level of rates, and dread of politicians.

In their attitude toward industrial power plants municipal managers have been far saner than the directors of companies. For nearly 30 years electric companies have been working towards a monopoly in the production of power, offering rates which made the

abandonment of factory engine rooms attractive to owners, conducting propaganda against efficient small generators developed abroad, cutting power rates to prevent installation of such equipment when enterprising manufacturers became aware of their economy, and building greater and greater power stations to handle the industrial load they had acquired. About a generation ago the Legislature added panic to obsession by departing from the theory of regulated monopoly and chartering "bulk supply" companies to meander about and compete with local companies for industrial loads.

At that time the possibilities of the residential load were not foreseen. Local companies fought against the invaders as though their future depended on the industrial load alone. Power prices dropped below the embarrassing level, bulk-supply companies were driven into buying control of local companies to get a market for their output. Then industry declined from the peak for which power stations were built, and since then companies have been looking at idle equipment and learning the value of the domestic load — a load for which volume, diversity, and steadiness, in season and out, surpasses any promise the industrial load has ever shown.

From this scramble for power customers municipal plants have been generally free. Where industrial plants were in operation in their territories, they let them operate, sometimes even buying or exchanging power. Consequently, they have not been obliged to earn on an idle investment during the last four years, and with the growing demand for electricity for residential use they have been able to increase their output and reduce their rates.

The fear of inaugurating low rates, to which electric companies have been subject, has hardly been felt by the managements of municipal plants. The fear is a product of "rate regulation" from which municipal plants are exempt. The electric companies in Massachusetts are not. Every company rate must be approved by the regulatory commission before it becomes effective, and a rate case may be initiated at any time by motion of the commission or by popular petition.

It is well known that the most powerful argument which can be urged against any rate is the fact that some other company has one that is lower. There may be no merit in the argument whatever, but it has a strong popular appeal which embarrasses a regulatory commission acutely to be obliged to ignore. It follows that the management of any company will find itself extremely unpopular with its associates in the industry if it breaks through the established level of rates.

Knowledge of this fact is responsible for such practices as piling up large surpluses for which there is no practical use, rebating to the customer one month's bill out of 12, or appealing some trifling rate case to the federal courts when common sense indicates a reduction and the increasing prosperity of the company makes it impossible to maintain the case in court.

Municipal plants are governed by no such incentive. They are outside the organization of the electric industry and free to set rates without regard to what the mass-interest of the industry may be held to require. A municipal manager may fix rates with regard only to the cost of the service, he may experiment with novel forms of rates, he may even establish a rate so low that it can be justified only by his belief that he can make it work. The manager of a company is bound by less simple considerations.

It may seem paradoxical to ascribe to municipal plants freedom from fear of politicians, which was listed as one of the obsessions of electric companies; that "public ownership means politics" has been asserted so often that it has come to have the force of an axiom. But a prolonged acquaintance with the troubles of company and municipal managers makes it clear that there is little difference in the political difficulties of their positions. Each complains bitterly of what he calls politics but each uses the word with a different meaning.

The phase of politics which the companies dread is that which is inspired by the Department of Public Utilities. Any local politician, or would-be politician, who can get 19 signatures to a petition and can induce perhaps a dozen signers to accompany him to a hearing, can get a rate case underway. By asking to have information compiled by the company and then asking for more, by putting in "exhibits" purporting to show something which will require weeks of statistical labor to disprove, a management can be kept from vacations working nights and Sundays, for the best part of a year.

But more is involved than temporary inconvenience. Difficulties of management are enormously increased by public distrust, and a portion of the public will inevitably be aroused by the mere fact of a contest to take sides against the company. As an aftermath, there will be an impairment of public relations which will require years to live down.

The management of a municipal plant is not obliged to cope with this aspect of practical politics. The manager, not the Department of Public Utilities, is the arbiter of rates, and political capital cannot be made out of them if they are kept within the limits prescribed by law.

In the 40 years of their operation, the municipal electric plants of Massachusetts have not only demonstrated the general proposition — that public ownership may be as effective as private ownership, but they have made two particular demonstrations of singular importance for the future. The first concerns the remarkable capability of electric plants of moderate size.

At the present time no electrical undertaking in

the State, whether privately or publicly owned, offers better residential rates than some municipal plants which supply populations of from 10,000 to 20,000. Such plants have established stepped rates which enable 600 units a month to be bought at an average rate of 2-1/3 cents, and one of them has recently set a new low average very close to 1 1/2 cents. Moreover, the ability to offer such a rate is independent of whether the supply of electricity is purchased in bulk from some outside source or generated by the municipality in a small fuel-burning power station of its own.

The criticism that such plants are unimportant because they are relatively small fails to grasp the profound significance of their achievement. What it means can be realized from the fact that most municipalities, even those included in the area supplied by large companies or "chains", have a moderate population. These small plants have shown that cheap electricity is not dependent on superpower projects, transmission lines, proximity to coal, oil, or some exceptional source of water power, but can be secured by any municipality larger than a village which is able to operate its own electric plant.

But the most important contribution of the Massachusetts experience to the philosophy of public ownership, at a time when the movement is receiving unprecedented encouragement, is the demonstration that the success of municipal plants is largely dependent on the provisions of their charter. In whatever provisions the Massachusetts law has been specific and mandatory, and has provided responsibility for enforcement and penalties for violations, it has been observed. Every plant fixes its rates to earn all operating expenses, provide for depreciation, and retire its debt. Every plant keeps its accounts and makes its reports as the law requires. Only where the law is vague or incomplete, or where no one is charged with its enforcement do mismanagement and political direction creep in.

Municipal operation is not a royal road to the service of the public; there is nothing inherent in it which will compensate for poor management, but good management comes in about the measure that is required by the organic law.

The foregoing analysis has pointed out:

1. That while there may be at present some variations in the prices paid, there should be in the long run no important difference in the wholesale cost of electricity to municipal plants and private companies of equal size, since both will secure their supply from a few large generating plants.

2. That the distribution costs of private companies are somewhat less than those of the municipal plants.

3. That the municipal plants have almost no new business expense whereas the private companies spend from 10 to 25 cents per customer per month for this purpose.

4. That commercial and general expense is very much higher for the private companies and that the average difference of 25 cents per customer per month is attributable principally to the higher cost of management.

5. That the municipal plants have been so largely paid for through the surplus earnings of past years that they are in general paying almost negligible amounts of interest.

6. That the municipal plants make a somewhat smaller allowance for depreciation than do the private companies.

7. That approximately 25% of the gross revenue of the private companies is paid out for taxes, interest and dividends, 10% for the former and 15% for capital.

8. That as the net result of all these variables, and more particularly of the last mentioned, the average domestic consumer of a municipal plant is paying appreciably less for electricity than a similar customer of a private company; but that more of the private companies have rate forms which encourage a freer use of electricity.

9. That the annual reports filed with the Department of Public Utilities can be made materially more valuable by the addition of a few important details.

If the amounts paid as salaries to the higher executives of the private companies and management fees absorb all savings resulting from more economical buying of supplies and a more efficient direction of the rank and file of the organization, there will be nothing left to offset the inherent advantages of the municipal plants in the matter of interest.

It would also be a calamity if the private companies should acquire the existing municipal plants. The present situation with private companies and municipal plants existing simultaneously in adjacent communities is far healthier than it would be if either group entirely superseded the other.

From the foregoing, it is easily seen that the estimated net yearly operating revenue warrants more careful consideration being given to the present conditions of our municipal electric light plant.

The commission, at this point, desires to impress upon both his Honor and the citizens of Peabody, the utterly inadequate and unreliable source from which we obtain our supply of electric current.

In the generating station at Endicott and Warren Streets, there is one electric generator with capacity sufficient to generate only one-half of your present electric load of 2,700 kw hours. The balance of your electric requirements are purchased from the A. C. Lawrence Leather Company in Peabody, who operate spare generator capacity in their power plant to produce this current. While you have been operating on this basis for sometime, all of the existing equipment is old. (Your own generator is more than twenty years old.) A serious breakdown would shut down

the least part of your system for several months, and would cause you a large loss of revenue and also result in partial shutdown and curtailment in production in many of the factories in Peabody.

The present peak load as briefly stated is 2,700 kw. per hour, and is practically the same factor both for day load and night load.

The current being supplied by the A. C. Lawrence Leather Company to the City is at a cost to the City of approximately \$55,000.00 annually and is being furnished from an old plant which is twenty-one years old and has reached a state of obsolescence. If anything should happen to this source of supply, it would leave our generating plant over-taxed 100%, an amount which would be approximately impossible for the City to care for.

This is a most serious situation which has existed for a long period of time and which has been ignored over a period of years. It becomes more serious when it is realized, that should this failure occur, it will not only affect industry, but also every home user of oil burning and refrigerating apparatus. We warn that a breakdown under the present conditions would certainly be a prolonged one and absolutely would cause suffering on the part of the general public because of the lack of sufficient current to take care of the needs most particularly of householders using electrical appliances dependent upon the use of electricity.

Again may we state that we cannot too forcefully call to your attention, as well as the public at large, the grave, serious situation which now faces them and which calls for prompt action on the part of such city officials who have the power to correct these conditions.

Again we desire to call to your attention the fact that should a national emergency arise, such as war, it is very probable that the source of supply now available at the generating plant, the A. C. Lawrence Leather Company, which totals approximately 7,500 kw., might possibly be insufficient to take care of manufacturing requirements and needs, with the result that the City under their former contract can be notified in accordance with the terms of that contract and the supply of current which they now receive from this source is discontinued.

The foregoing is a most unreliable position to place the citizens of Peabody in and steps should immediately be taken to insure these citizens that no such hardships as pictured above can affect them.

To correct this situation, it is proposed by this commission to install additional electrical power generating equipment in the existing power plant building. There should be installed two 5,000 HP electric generators driven by steel turbines and two steel boiler units together with all necessary auxiliaries and accessories. The present building is suitable for housing this equipment with a reasonable amount of remodeling.

By following out this recommendation, it will be unnecessary for the City of Peabody to purchase from the A. C. Lawrence Leather Company, approximately 3,000,000 kw. of current for which they pay \$55,000.00 a year to said company at the rate of .0157 per kw. hour. This cost of .0157 per kw. for current purchased from the A. C. Lawrence Leather Company compares with the kw. income to the City of .015 and further is comparable to .012 paid by the Town of Danvers.

The gross revenue of the plant amounts to \$325,000 annually and the net profit rate being applied to the tax rate varies between \$88,000 at the present time and \$120,000 in some other years.

From the data submitted by Mr. Arthur L. Nelson, retained by the Department in 1937, to make a survey of the same, it has been proven that if a new plant is installed by the City of Peabody, a savings of \$75,000 a year in operating costs by creating an increased efficiency by the use of new apparatus — can almost pay off incurred indebtedness.

With a new plant, the present load factor can be increased by at least 40% above that now being sold and the incurred debt can be completely wiped out in about seven years.

A survey of the abandoned property of the L. B. Southwick property now owned by the City of Peabody, was made by the commission for the purpose of determining the advisability of relocating the electric plant at this location.

The commission studied the water conditions available for necessary water condensing as well as the possibilities of increasing the volume of said water.

This site of course, is more central for the distribution of steam power than is the present site at Warren Street. The linear distance between both sites and a point at the corner of Central and Walnut Streets was found to be but a few thousand feet.

The Commission does not feel, however, that it would be advisable to relocate the electric light plant just for the purpose of making a more central location for the distribution of live steam. This conclusion was reached after a consideration of the fact that such a relocation would cost an additional \$100,000.00 while the estimated revenue from the live steam sales would be approximately 76,000 lbs. per hour — Fifty cents per lb. — or a total gross revenue of \$40,320.00 per year against a total investment of \$93,600.00 for installing conducting pipe to feed the customers.

However, if the city does not secure the land owned by the A. C. Lawrence Leather Company, which is adjacent to the present plant on Warren Street, and upon which the buildings have been demolished, this Commission recommends that a new plant be erected on the L. B. Southwick site.

Approximately 10,000,000 kw. hours of current are now being sold annually by the City, and if this entire amount was being purchased instead of 3,000,000 of the amount at a cost of .0157 per kw.

hour as against the City's estimated cost of generating this same amount, at an estimated cost of .0070 or less than 1/2 of the foregoing figure or an actual savings of .0087 if the new plant is installed, will at a consumption figure of 10,000,000 per annum show an annual savings in the plant operation under the present conditions of \$87,000.00, which will be sufficient to wipe out the debt incurred by special new development in a period of approximately seven years.

Thus it can be seen that all this can be accomplished without increasing rates, while on the other hand, with a load expansion of 40% by this new apparatus, which is not possible under present conditions, it is quite conceivable in that the rates to consumers may be reduced.

The early carrying charges of the new investment required for the proposed installation, including interest, depreciation, and insurance, can be paid out of the earnings of the electric light department and no part of this investment need be contributed from City funds.

As a matter of fact, these early charges will be less than the amount now paid for the purchase of a part of your electrical requirements. New electrical generating equipment is more modern and highly economical than that now installed.

The main steel turbines should be designed so that the bulk of the steam after passing through the turbines, may be extracted and paid to factories instead of wasting away in the condensing cooling water as at present. This feature could be of great advantage to the factories in Peabody as thoroughly discussed in detail in Mr. Nelson's report.

With new and highly economical equipment, your entire electrical requirements could be produced at approximately 1/4 of your present costs. This economical production of your electricity with the additional income deprived from the sale of steam would result in more than developing the present net earnings of this department. With largely increased net earnings, it would be possible to contribute each year to the city, increased amounts from surplus. These amounts would be useful in the reducing of the taxes in Peabody. You will also be able to make material reductions in the rates of electric light and power.

Since some month's time will be required for the installation of the proposed new electric generating equipment, arrangements for its purchase and installation should be made at the earliest possible date.

Condensing Facilities:

The matter of investigation of the water facilities for condensing purposes has been entered into with the result that the City Solicitor, Mr. Liacos, appeared before the commission for the purpose of explaining the rights of the City of Peabody in regards to Crowninshield Pond and as they affected our condensing requirements. Mr. Liacos produced for the commission a copy of the deed of Blaney to the Town of Peabody, which stated in consideration of \$1600.00 said Blaney conveyed to the Town of Peabody a certain lot of land as shown on plans and consisting of 26,000 square feet. He further stated that the Town of Peabody was allowed under the same to take the water for condensing purposes so long as this process did not infringe upon the rights of others. The City Solicitor stated further that it was his opinion that Blaney did not give the fee to this pond to anybody, and he further gave his opinion that the City could take additional land if necessary, whether this land included the property of the A. C. Lawrence Leather Company or the Boston & Maine Railroad. Mr. Liacos has cited for the commission old transfers of land adjacent to Crowninshield Pond and gave his opinion that the City was secure in its rights to use the water of said pond for electrical purposes.

As a result of these opinions, your commission recommends that the Warren Street site, now occupied by the present electric light plant, be retained and enlarged and that the additional land necessary for enlarging the present plant be purchased from the A. C. Lawrence Leather Company and on the northerly side of Endicott Street, together with land of the Boston & Maine Railroad on the track of said railroad be acquired. This commission further recommends that a survey be made and right obtained for an additional water supply for the purpose of increasing the capacity of Crowninshield Pond during periods of drought.

In view of the fact that the existing conditions are highly dangerous as regarding safety and continuity of service, your commission further recommends that the present electric light plant be enlarged, remodeled, by making changes in accordance with the recommendations as detailed in the report submitted by A. L. Nelson, Engineer, under date of November 10th, 1937.

It is further recommended that the design of the turbines be such that they may be bled for the purpose of supplying steam in the future to manufacturers and others desiring to buy the same as a by-product of the proposed new plant.

The existing conditions are highly dangerous as regards safety and continuity of service to your Department in Peabody.

The present peak load on your electric system is 2700 kilowatts.

In your generating station on Endicott and Warren Streets there is only one electric generator with a capacity of 1500 kilowatts. This machine is more than twenty years old and not in the best of condition.

In your power plant there are also two boilers having only sufficient capacity in both together to furnish the steam necessary to operate the 1500 kilowatt generator.

The balance of your electric requirements beyond what can be generated by the 1500 kilowatt unit (nearly half of the total required) is purchased from the

local factory of the A. C. Lawrence Leather Company, who operate spare generating capacity in their own power plant to produce this power. This is also an old power plant with old equipment.

Obviously any serious accident or breakdown of equipment at your generating station (or at the power plant of the A. C. Lawrence Leather Company) would have the most serious consequences in Peabody. It would undoubtedly cause the partial shutdown of a considerable number of factories in Peabody due to the lack of electric power as well as placing the city in partial darkness at night which conditions might obtain for a period of several months.

The recent fire in the switchboard at your power plant with the resultant interruption to your service is a small indication of what might happen as a result of a serious breakdown in your plant.

The cost of producing electricity in your present plant is high due to the operation and maintenance of old and inefficient equipment, and also due to the purchase of a large portion of your electricity at a comparatively high price.

It is proposed to install in the generator room of your existing power plant at the corner of Endicott and Warren Streets two 5000 horsepower electric generators driven by steam turbines and complete condensers and all auxiliaries. There is ample space in this room for these generators in the place formerly occupied by old engine-driven generators. A portion of the existing floor will be removed and adequate concrete foundations for the new units installed. The generators will feed power on to the present bus to be distributed from the new switchboard now being installed.

The steam turbines driving these generators will be arranged so that steam may be extracted from them at 150 pounds pressure for distribution to factories through a pipe line.

The two new steam boiler units will be installed in the southwest portion of the present building which is now partially occupied by lockers and stock room (which will be placed in another location) and the building will be remodelled for this purpose. The boilers will produce steam at high pressure and temperature and each unit will have sufficient capacity to supply the steam required by one turbine-generator unit. With the boilers will be installed all necessary auxiliaries and accessories.

The existing 1500 kilowatt electric generator and the two existing steam boiler units will be maintained in operating condition so that they may be used in case of emergency if needed.

The proposed general arrangement of new equipment is shown on Drawing 4050-C-1, a print which is included in A. L. Nelson's report.

The cost of the proposed new plant installation is estimated as between \$500,000 and \$600,000.

The new plant installation outlined above will have sufficient capacity with one electric generator and one steam boiler out of service to carry an electric load of approximately double your present peak load.

When in the future your electric load reaches this point — namely, approximately twice your electric load — you may remove the old existing 1500 kilowatt generator and the two old existing steam boiler units and in their place add one more new electric generator and one new steam boiler unit of suitable capacity with their auxiliaries. The existing building can be readily remodelled to take this equipment.

This future extension should prove to be an economical plant addition, which will adequately provide for future growth in load on your system.

In this report it is proposed to install new electric generating equipment in your existing power plant building on Endicott and Warren Streets with proper remodelling of the buildings and foundations.

In carrying out this study several other possible sites in Peabody for the installation of the new equipment were considered.

After full consideration, the development on a new site was abandoned, due chiefly to the increased cost of plant involved. With a new site in the first place, it would be necessary to construct an entire new power plant building. Also, if we were to provide large storage space for fuel a large additional investment in fuel handling plant and equipment would be involved.

In addition to this distributing electricity from a new central point would involve extensive and costly changes in your electric distribution system.

Since the above items would probably add more than \$100,000 to the investment cost of the new plant, without changing the efficiency or economy of the plant operation, it was felt that the development on the existing site was best.

The main electric generating units to be installed in your power plant will be so arranged that the bulk of the steam, after passing through the driving turbines, may be extracted and distributed through a pipe line to the factories in Peabody for heating and power uses, instead of being thrown away in the condenser cooling water as at present.

This steam service will be of marked advantage not only to your Department (as a source of additional revenue), but also to a high degree to the various factories as a means of increasing the economy of their operation and accomplishing lower power costs.

Such service to a factory probably does not mean any change in factory labor, since the present forces will be needed to operate the factory steam and electric power systems. It does, however, relieve the owners and management of a factory of the cost of maintenance of a boiler plant, and particularly relieves them of the comparatively large investment required for the replacement of old and worn out boilers and equipment, making the capital funds thus free available for use in the business proper. It also eliminates the

many charges for materials and incidental labor necessary for the operation of a boiler plant.

As far as the convenience, reliability and economy is concerned, such steam service is ordinarily more satisfactory than the operation of a local factory boiler plant. The steam will be extracted from the main turbine at the power plant and distributed through a pipe line at 150 pounds per square inch pressure. From the steam mains a branch pipe line will be brought into the factory at a convenient location. At this point, automatic regulating valves will be installed to give the pressure and temperature of steam desired for use in the factory. The steam when required by the factory may be obtained by opening the valve of their supply line. When steam is not required, as may be the case on nights, Sundays, holidays, and shutdown periods, it may be turned off by closing the valve. This eliminates the cost of operating local factory boiler plants with banked fires during such periods.

With such a system increased steam capacity may be obtained by a factory more quickly, conveniently, and economically than by adding to the boiler capacity in their own plant.

In any factory the steam obtained from such a system may be regulated at high pressure for use in steam engines or for low pressure for use in building heating systems and in process, or if desired may be regulated for both conditions. The fact that the steam for this system will be produced in modern high efficiency boilers and will be extracted from the main turbines rather than thrown away in condensing cooling water will enable the Peabody Electric Light Department to sell this steam at a low price. The operation of such a system should be a material help to the manufacturers in Peabody in reducing their power costs and thereby reducing the costs of manufacturing their various products.

Your present situation in the Electric Light Department at Peabody is dangerous due to the lack of adequate generating facilities for the production of the electricity required. An accident to your power plant might cause a partial shutdown of your system for several months.

The yearly carrying charges in this new plant installation (including interest, depreciation and insurance) can be paid for out of the earnings of the Electric Light Department and no part of the new investment in plant need be contributed by the City. As a matter of fact, these yearly charges will be less than the amount you now pay for the purchase of a part of your yearly electrical power requirements.

In addition the new plant will operate on such an economical basis that your net earnings will be more than doubled. This will make possible increased contributions to the City to apply to reduction in taxes, as well as making possible material reductions in the price of electricity for light and power in Peabody.

Very truly yours,

(Signed)

JOHN F. JORDAN, M. D.
VINCENT P. O'KEEFE, Sec.
DANIEL J. BOYLE
JOHN S. MARTIN